



2005

New Hampshire
Department of Agriculture
Markets and Food, Plant Industry Division
&
New Hampshire
Invasive Species Committee

Introduction

Throughout the United States and Canada, non-native invasive species have become an overwhelming problem resulting in impacts to the natural environment and managed landscapes. Invasive species typically possess certain traits that give them an advantage over most native species. The most common traits include the production of many offspring, early and rapid development, and adaptability and high tolerance to many environmental conditions. These traits allow invasive species to be highly competitive and, in many cases, suppress native species. Studies show that invasives can reduce natural diversity, impact endangered or threatened species, reduce wildlife habitat, create water quality impacts, stress and reduce forest and agricultural crop production, damage personal property, and cause health problems.

Invasive species began arriving in North America in the mid-to-late 1700s by various means. Many were brought here for ornamental uses, erosion control, or to provide for wildlife habitat. Others arrived inadvertently through international travel and commerce.

Impacts and Actions

Biologists have found that invasive species cover more than 100 million acres of land in the U.S. and their population numbers continue to spread. The repeated process of spread has become so extreme that invasive species cost the United States billions of dollars per year. This is a result of lost agricultural and forest crops, impacts to natural resources and the environment, and the control efforts required to eradicate them.

On February 3, 1999, President Clinton signed Executive Order 13112, which established the National Invasive Species Council. The Council is responsible for assessing the impacts of invasive species, providing the nation with guidance and leadership on invasive species issues, and seeing that Federal programs are coordinated and compatible with state and local initiatives.

Each state is also required to participate by evaluating and responding to their invasive species concerns. In the summer of 2000, the State of New Hampshire passed House Bill 1258-FN, which created the Invasive Species Act (ISA) and the New Hampshire Invasive Species Committee.

New Hampshire Invasive Species Committee

The New Hampshire Invasive Species Committee (ISC) is an advisory group for the Commissioner of the NH Department of Agriculture, Markets & Food, Division of Plant Industry (DAMF) on matters concerning invasive species in the state. The ISC consists of 11 appointed members representing the following: the NH Department of Agriculture, the NH Department of Environmental Services, the NH Department of Resources & Economic Development, the NH Department of Transportation, the NH Department of Fish & Game, The College of Life Science & Agriculture of the University of NH, the UNH Cooperative Extension, The Nature Conservancy, horticultural interests, general public interests, and Livestock owners and feed growers interests. The ISC meets once a month to conduct the following efforts:

- Review information;
- Evaluate and discuss potentially invasive plant, insect and fungi species of concern;
- Host guest presentations on related topics;
- Develop outreach and educational materials;
- Formulate management practices as guidance for the control of invasive species; and
- Prepare lists of proposed prohibited and restricted species, which appear on the following pages.

(Note: This committee is not charged with the evaluation or listing of aquatic plant species, which is conducted by the Department of Environmental Services under RSA-487:16-a. However, a brief description of the program and four of the aquatic species are described on pages 15, 16 & 17 of this booklet).

New Hampshire Rules

In accordance with the Invasive Species Act (ISA), HB 1258-FN, the DAMF is the lead state agency for terrestrial invasive plants, insects and fungi species. The DAMF has the responsibility for the evaluation, publication and development of rules on invasive plant species. This is for the purpose of protecting the health of native species, the environment, commercial agriculture, forest crop production, and human health. Therefore, the rule, Agr 3800, states that **no person shall knowingly collect, transport, sell, distribute, propagate or transplant any living or viable portion of any listed prohibited invasive plant species including all of their cultivars, varieties, and specified hybrids** (see the New Hampshire Department of Agriculture's website at www.agr.state.nh.us to review the complete set of rules).

New Hampshire Prohibited Invasive Plant Species

* Denotes that these species shall be prohibited as of January 1, 2007

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New Hampshire Prohibited Aquatic Invasive Plant Species

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WHAT YOU CAN DO

There are many things that you, as an individual, can do to help control the spread of invasive species and preserve native flora and fauna:

- Minimize impacts to natural vegetation, soils, and drainage.
- Learn how to identify invasive plants and know how to tell them apart from native species.
- Control invasives on your property by following recommended practices.
- When landscaping, ask your local garden center or contact your County Extension Service about alternative plantings.
- Become active in local or regional initiatives to control invasives.
- Report the occurrences of invasive species to the Department of Agriculture.
- After working in an area with invasive species, check for soil, or propagules that may have adhered to clothing, shoes, vehicle tires, etc.

CONTROL METHODS

Mechanical: Mechanical control involves hand pulling, digging, cultivation, mowing, cutting or utilizing some type of physical barrier such as a tarpaulin, mulch, wood chips, etc. This method is most effective when populations of unwanted species are low.

Cultural: Cultural control is the manipulation of a plant community to prevent the introduction or spread of an unwanted species. This can be accomplished by modifying the growing environment such as the soil, available light or moisture, or planting trees or shrubs that can outcompete the invasive species.

Chemical: Chemical control involves the use of an approved herbicide to manage a targeted species. The application method must be chosen to avoid damage to beneficial or native species. The applicator must adhere to all State and Federal pesticide regulations and in many cases be licensed by the state. (For more information, contact the NH Department of Agriculture's Pesticide Control Division at 603-271-3550 or www.agr.state.nh.us.)

Biological: Biological control is the use of native or introduced beneficial organisms to naturally reduce populations of unwanted species. Most biological controls are found to be self-sustaining and host specific.

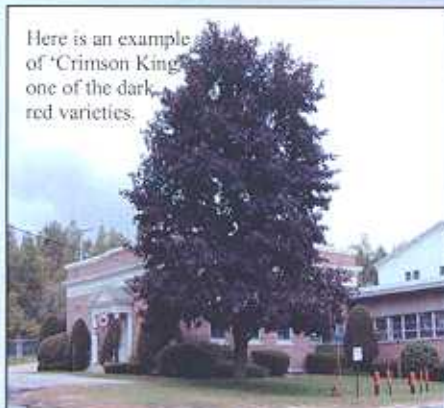
Acer platanoides Norway Maple

Family: Aceraceae

Native to: Europe

Description: Large deciduous tree 60' high by 40' wide. **Bark:** Grayish, somewhat furrowed. **Twigs:** Smooth, olive-brown. **Buds:** Terminal, imbricate, rounded, smooth, greenish-red. **Leaves:** Opposite, 4-7" wide, 5-lobed, dark green to dark red above, lustrous below. **Flowers:** Greenish-yellow, April. **Fruit:** Horizontal samara. **Zone:** 3-7. **Habitat:** Moist, well drained soils, full sun to partial shade. **Spread:** Seeds spread by wind and water. **Comments:** Leaf stalks exude milky white sap. Fast growing, buds break earlier than most native species. Naturalizes in woodlands where it can outcompete native species. **Controls:** Hand pull seedlings. Slash bark and apply herbicide to wounds.

Here is an example of 'Crimson King', one of the dark red varieties.



Photos by Douglas Cygan

Ailanthus altissima Tree of Heaven

Family: Simaroubaceae

Native to: China

Description: Deciduous tree up to 60' tall by 40' wide. **Bark:** Grayish, slightly furrowed. **Twigs:** Reddish-brown. **Leaves:** Compound, 18-24" long with 13-25 leaflets arranged alternately on stem, lanceolate, 3-5" long with 2-4 teeth near base. **Flowers:** Panicles, 8-16" long, yellowish-green, mid-June. **Fruit:** Samara. **Zone:** 4-8. **Habitat:** Highly adaptable and pollution tolerant, full sun to partial shade. **Spread:** Seeds are wind dispersed. **Comments:** Very fast growing, dense canopy shades out native species. **Controls:** Remove seedlings and saplings by hand. Larger trees can be mechanically removed or cut. To prevent suckering, if trees are cut, apply herbicide to cut portion of stump.



Photos by Douglas Cygan

Alliaria petiolata Garlic Mustard

Family: Cruciferae
Native to: Europe

Description: Cool season biennial, 2nd year plants flower and reach 2-3½' tall. **Leaves:** Triangular, coarsely toothed, heart-shaped. **Flowers:** Umbel, small, 4-petals, white, April-May. **Fruit:** Pods, seeds turn black when mature. **Zone:** 4-8. **Habitat:** Prefers moist shaded floodplains, forests and roadsides, adaptable to most soil and light conditions. **Spread:** Seeds spread by water and wildlife. **Comments:** Plants spread quickly into natural areas leading to competition and displacement of native species. **Controls:** Small populations can be hand pulled while large populations can be continuously cut back to prevent flowering and seed production. Herbicide treatments are also effective.



Photos courtesy of Leslie J. Mehrhoff/UCONN-IPANE

Berberis thunbergii Japanese Barberry

Family: Berberidaceae
Native to: Japan

Description: Deciduous shrub, 2-4½' tall. **Leaves:** Ovate, simple, entire. Color varies depending on variety. **Flowers:** Small yellowish, bloom in May in clusters of 2-4. **Fruit:** Drupe, turning red in summer. **Zone:** 4-8. **Habitat:** Prefers well drained soils in semi shade and often occurring in forests, roadsides, and open fields. **Spread:** Seeds are dispersed by wildlife. **Comments:** Forms dense thickets in natural environments where it becomes established, resulting in impacts to native flora and fauna. **Controls:** Remove small immature plants by hand. Dig larger plants with a garden spade or remove mechanically. Cut stems at base or control with herbicide treatment.



Photos by Douglas Cygan

Berberis vulgaris European Barberry

Family: Berberidaceae
Native to: China

Description: Shrub 3-6' in height by similar width. **Stems:** Tan with 3 spines at each leaf axis. **Leaves:** Alternate, simple, $\frac{1}{2}$ -1 $\frac{1}{2}$ " long, bright green above. **Flowers:** Perfect, yellow, $\frac{1}{2}$ " long, mid-April to May. **Fruit:** Oblong drupe turning pale red in fall. **Zone:** 4-8. **Habitat:** Prefers full sun to partial shade and open spaces to wooded areas. **Spread:** Seeds are dispersed by birds. **Comments:** Highly adaptable to most environments and is pollution tolerant. **Controls:** Hand pull young plants. Cut or mechanically remove older larger plants or apply approved herbicides for large populations.



Photos by Douglas Cygan

Celastrus orbiculatus Oriental Bittersweet

Family: Celastraceae
Native to: Japan, China

Description: Deciduous vine reaching heights of 40-60'. **Bark:** Tanish, furrowed. **Leaves:** Alternate, ovate, bluntly toothed, 3-4" long by $\frac{2}{3}$'s as wide, tapered at the base. **Flowers:** Small, greenish, blooming in spring. **Fruit:** Yellow dehiscent capsule surrounding an orange-red aril. *Fruits occur in the axils of the stems whereas native bittersweet (Celastrus scandens) fruits at the ends.* **Zone:** 4-8. **Habitat:** Disturbed edges, roadsides, fields, forests and along rivers and streams. **Spread:** Birds and humans. **Comments:** Very aggressive, climbs up and over trees and smothers them. Do not buy wreaths made of these vines. **Controls:** Difficult to manage. Herbicide use is recommended on foliage or by stump application.



Photos by Douglas Cygan

Cynanchum nigrum Black Swallow-Wort

Family: Asclepiadaceae
Native to: Eurasia

Description: Perennial herbaceous vine that grows to 6'. **Leaves:** Opposite, lanceolate, dark glossy green, simple with a smooth edge, 2-4" long. **Flowers:** Small $\frac{1}{4}$ ", 5-petaled, purplish, from June to September. **Seed:** Seeds are similar to those of milkweed. **Zone:** 4 to 8. **Habitat:** It prefers full to partial sun. **Spread:** Seeds dispersed by wind. **Comments:** Invades roadsides, fields, disturbed sites, meadows, and woodlands, outcompeting native species. **Controls:** Hand pull young plants. Remove and destroy seed pods before they open. Apply herbicides as a foliar spray during the growing season. If plants are to be dug, use a spade and make sure that all root fragments are removed.



Photos by Douglas Cygan

Cynanchum rossicum Pale Swallow-Wort

Family: Asclepiadaceae
Native to: China

Description: Perennial vine growing to 3-6'. Very similar to black swallow-wort with the exception of the flowers. **Leaves:** Opposite, lanceolate, 2-4" long. **Flowers:** Magenta, $\frac{3}{8}$ ", flowering from June to September. **Seed:** Seeds are similar to milkweed. **Zone:** 4 to 8. **Habitat:** It prefers full to partial sun. **Spread:** Seeds dispersed by wind. **Comments:** Invades roadsides, fields, disturbed sites, meadows and woodlands, outcompeting native species. **Controls:** Hand pull young plants. Remove and destroy seed pods before they open. Apply herbicides as a foliar spray during the growing season. If plants are to be dug, use a spade and make sure that all root fragments are removed.



Photos courtesy of John M. Randall/The Nature Conservancy

Elaeagnus umbellata Autumn Olive

Family: Celastraceae
Native to: Asia

Description: Weedy deciduous shrub measuring 20' by 20'. **Bark:** Silvery-gray and smooth with whitish lenticels. **Stems:** Cinnamon-brown. **Leaves:** Elliptical, 2-3" long, glossy, green above and silverish below. **Flowers:** Solitary, whitish, 4-petaled, mid-June. **Fruit:** Drupe. **Zone:** 3-8. **Habitat:** Naturalizes in open spaces exposed to full sun. **Spread:** Seeds dispersed by birds and wildlife. **Comments:** Very aggressive. Outcompetes and displaces native species. **Controls:** Remove seedlings and saplings by hand. Larger shrubs can be mechanically removed, or cut and apply herbicide to stump.



Photos by Douglas Cygan

Euonymus alatus Burning Bush *

Family: Celastraceae
Native to: Asia

Description: Deciduous shrub reaching 20' in height and width. **Stems:** Greenish with corky wings. **Leaves:** Oppositely arranged, simple and elliptic, 1-3" long by half as wide, light green. **Flowers:** Inconspicuous greenish-yellow, May to June. **Fruit:** Fleshy green capsule turning red in fall. **Zone:** 3 to 8. **Habitat:** Prefers dry upland soils, full sun to heavy shade, pH adaptable. **Spread:** Seeds are dispersed by birds and wildlife. **Comments:** Outcompetes and displaces native species. **Controls:** Hand remove seedlings and saplings. Use a spade or shovel to dig out larger plants. Large populations may be controlled with herbicide use.



Photos by Douglas Cygan

Heracleum mantegazzianum Giant Hogweed

Family: Apiaceae
Native to: China

Description: Biennial growing to 15' in height. **Stems:** Greenish with purple splotches, 2-4" diameter with coarse hairs, hollow. **Leaves:** Large, compound, deeply incised, 3-5' wide, hairy on underside. **Flowers:** White inflorescence, 1-2' in diameter, May late June. **Seeds:** Flattened, $\frac{3}{8}$ " long, ovate and tan with 4 brown resin canals. **Zone:** 3-8. **Habitat:** Found in wet areas, roadsides, gardens, open spaces, full sun to partial shade. **Spread:** Seeds dispersed by water, wildlife and humans. **Comments:** The clear, watery sap is phototoxic to human skin, causing severe blistering and burns. Spreads readily and displaces native species. **Controls:** Remove plants by digging up tap root.



Photos by Douglas Cygan

Iris pseudacorus Yellow Flag Iris

Family: Iridaceae
Native to: Europe

Description: Herbaceous perennial forming dense clumps. **Leaves:** Long, strap-like, attached to rhizome. **Flowers:** Bright yellow, May to early June. **Fruit:** Capsule, 6-sided. **Zone:** 5-9. **Habitat:** Naturalized in wetlands, stream banks and ponds. **Spread:** Rhizome fragments spread by water and small mammals. **Comments:** Overcrowds wetlands and displaces native species. **Controls:** Remove by hand or use a spade to dig rooting system.



Photos courtesy of Mandy Tu/The Nature Conservancy

Lonicera morrowii Morrow's Honeysuckle

Family: Caprifoliaceae
Native to: Japan

Description: Shrub reaching 6-8' tall. **Stems:** Smooth, glabrous, tanish, hollow. **Leaves:** Ovate, simple, entire, opposite, pubescent beneath, 1-2 1/2" long. **Flowers:** Tubular, white, turning yellow with age, May to June. **Fruits:** Berry turning red. **Zone:** 3. **Habitat:** Moist to wet shaded floodplains, forests, roadsides, fields, waste places. **Spread:** Seeds are dispersed by wildlife and humans. **Comments:** Rapidly invades sites, forming a dense vegetative layer that outcompetes native flora and fauna species. **Controls:** Hand control is effective for small plants, while mechanical removal and repetitive cutting also work well. Herbicide treatment is better for areas with greater infestations.



Photos by Douglas Cygan & Leaf Photo by Leslie J. Mehrhoff

Lonicera x bella Showy Bush Honeysuckle

Family: Caprifoliaceae
Native to: Eurasia

Description: Shrub reaching 20' in height and width. **Stems:** Greenish to tan with corky wings. **Leaves:** Oppositely arranged, simple and elliptic, 1-3" long by half as wide, light green. **Flowers:** Yellow, white or pink, May to early June. **Fruit:** Fleshy red, forming in pairs in leaf axis. **Zone:** 4. **Habitat:** Prefers dry upland soils, full sun to heavy shade, pH adaptable. **Spread:** Seeds are dispersed by birds. **Comments:** *L. x B-bella* is a cross between *L. tatarica* & *L. morrowii*. Spreads into natural areas forming dense stands, which displace native species. **Controls:** Hand or mechanical removal, continuous cutting, girdling, and herbicide treatment.



Photos courtesy of Leslie J. Mehrhoff/UCONN/IPANE

Lonicera japonica Japanese Honeysuckle

Family: Caprifoliaceae
Native to: Eurasia

Description: Climbing vine. **Stems:** Reddish-brown, pubescent. **Leaves:** Opposite and not clasping the stem as opposed to the three native honeysuckle vines that do clasp the stem, oblong, $1\frac{1}{2}$ -2" long, rounded at base. **Flowers:** Tubular, white or yellow, fragrant, May to mid-July. **Fruit:** Berry, smooth, blackish to slightly purplish. **Zone:** 4-8. **Habitat:** Prefers moist soils and full sun to partial shade. **Spread:** Seeds spread by wildlife. **Comments:** Vines grow quickly, covering native vegetation, resulting in loss of habitat. **Controls:** hand or mechanical removal, cutting, girdling, chemical.



Photos courtesy of John M. Randall/The Nature Conservancy & Leaf Photo by Leslie J. Mehrhoff

Lonicera tatarica Tatarian Honeysuckle

Family: Caprifoliaceae
Native to: Eurasia

Description: Upright deciduous shrub reaching 6-15' tall. **Stems:** Smooth, glabrous, tan, hollow. **Leaves:** Ovate, smooth, bluish-green, opposite, $1-2\frac{1}{2}$ " long. **Flowers:** Tubular, pink or white, April to May. **Fruit:** Berry with two seeds, turning red in fall. **Zone:** 3. **Habitat:** Understory species in woodland sites, also invades open spaces. Thrives in moist soils. **Spread:** Seeds dispersed by wildlife and humans. **Comments:** Rapidly invades forests, fields, roadsides and floodplains. Outcompetes native species. **Controls:** Hand control is effective for small plants while mechanical removal, cutting and chemical applications are better for larger stands.



Photos by Leslie J. Mehrhoff & Berry Photo by Douglas Cynam

Ligustrum obtusifolium Blunt-leaved Privet

Family: Oleaceae
Native to: Europe

Description: Shrub reaching 12' tall by 10-12' wide. **Stems:** Greenish, smooth. **Leaves:** Opposite, simple and elliptic, 1-3" long by half as wide, blunt tipped, light green. **Flowers:** Small white panicles, May to early June. **Fruit:** Small blackish drupe. **Zone:** 4-7. **Habitat:** Prefers dry upland soils, full sun to heavy shade, pH adaptable. **Spread:** Seeds dispersed by birds. **Comments:** Becomes established in natural areas leading to competition and displacement of native species. **Controls:** Hand or mechanical removal, cutting, herbicide applications.



Photos courtesy of Leslie J. Mehrhoff/UCONN-IPANE

Polygonum cuspidatum Japanese Knotweed

Family: Celastaceae
Native to: Japan

Description: Herbaceous perennial reaching 10' in height and width. **Stems:** Greenish, hollow and jointed, similar to bamboo. **Leaves:** Alternate, broadly ovate, 3-7" long. **Flowers:** Small, whitish, forming panicles, August-September. **Seeds:** Brown, triangular, enclosed in a 3-winged calyx. **Habitat:** Found in woodland sites, open spaces, ditches, roadsides, riverbanks. Prefers moist, well-drained soils. **Spread:** Vegetatively and by seed. **Comments:** Fast growing, aggressive, easily spreads and reproduces vegetatively. **Controls:** Hand or mechanical removal ensuring all roots and propagules are removed, continuous mowing/cutting or chemically.



Photos by Douglas Cygan

Rhamnus cathartica Common Buckthorn

Family: Rhamnaceae
Native to: Eurasia

Description: Deciduous shrub or small tree measuring 20' by 20'. **Bark:** Grayish to brown, rough with raised lenticels. **Stems:** Cinnamon colored with a terminal spine. **Leaves:** Oppositely arranged, simple and broadly ovate with toothed margins, dark glossy green above. **Flowers:** Inconspicuous, 4-petaled, greenish-yellow, May to early June, dioecious. **Fruit:** Fleshy $\frac{1}{4}$ " diameter, turning black in fall. **Zone:** 3-7. **Habitat:** Thrives in wet areas with rich to poor soils, full sun to heavy shade, and pH adaptable. **Spread:** Fruits are dispersed by birds. **Comments:** They are highly aggressive, forming dense thickets which displace native species and reduce wildlife habitat. **Controls:** Hand remove, dig seedlings/saplings, continuously cut or apply herbicide.



Photos courtesy of John M. Randall/The Nature Conservancy

Rhamnus frangula Glossy Buckthorn

Family: Rhamnaceae
Native to: Japan

Description: Tall deciduous shrub up to 20' in height by 15' wide, **Bark:** Grayish with whitish lenticels. **Twigs:** Reddish-brown. **Leaves:** Ovate, 4-5" long by 3-4" wide, arranged oppositely or whorled on stem. **Flowers:** Small, greenish-white, mid-June. **Fruit:** Fleshy, turning black in the fall. **Zone:** 2-7. **Habitat:** Highly adaptable and pollution tolerant, full sun to partial shade. **Spread:** Seeds are bird dispersed. **Comments:** Very fast growing, dense canopy shades out native species. **Controls:** Remove seedlings and saplings by hand. Larger trees can be mechanically removed or cut. To prevent suckering if trees are cut, apply herbicide to cut portion of stump.



Photos by Douglas Cygan

Rosa multiflora Multiflora Rose

Family: Rosaceae
Native to: Japan & Korea

Description: Perennial shrub reaching 10' in height and width. **Stems:** Long and arching, forming dense clumps, thorns may or may not be present. **Leaves:** Alternately arranged, compound with 7-9 leaflets. **Flowers:** Clusters of white or pink, June to July. **Fruit:** Rose hip turning red in fall. **Zone:** 3-8. **Habitat:** Prefers moist, well drained soils, full sun. **Spread:** Fruits with seeds are dispersed by birds. **Comments:** Very aggressive, leading to competition and displacement of native species. **Controls:** Hand or mechanical removal, cutting, girdling, chemical.



Photos by Douglas Cygan

New Hampshire Department of Environmental Services Aquatic Invasive Plant Species

New Hampshire's water resources are vast, including over 800 lakes and ponds, 11,000 miles of rivers and streams, and thousands of acres of diverse wetland habitat. Many of these once pristine waterbodies are now degraded by dense growth of exotic aquatic plants like milfoil (*Myriophyllum*), fan-wort (*Cabomba*), and water chestnut (*Trapa*). Several other plants, such as *Hydrilla* (*Anacharis*), are looming just over our borders.

On January 1, 1998, legislation became effective to prohibit certain activities associated with exotic aquatic plants so that we can better protect our precious aquatic resources from the threat of invasion. Specifically, RSA 487:16-a states that "*No exotic aquatic weeds shall be offered for sale, distributed, sold, imported, purchased, propagated, transported, or introduced in the state.*" Fines or other enforcement actions may be imposed for violations of this act. The following describes 4 of New Hampshire's 14 prohibited aquatic plant species.

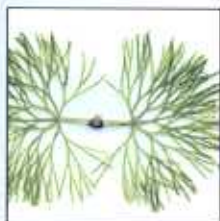
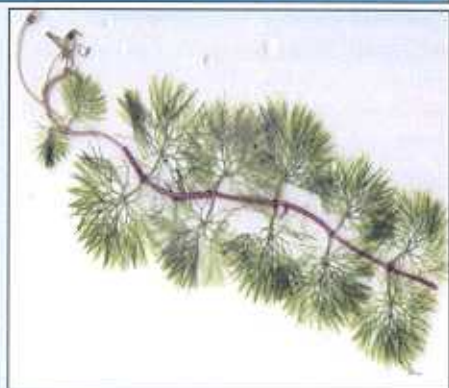
Cabomba caroliniana Fanwort

Family: Cabombaceae
Native to: South America

Description: Submersed, rhizomatous, aquatic perennial that grows 15' tall.

Leaves: Opposite, peltate, 3/4-2" long and repeatedly divided into filiform segments. There are also floating leaves that are linear-elliptic, entire and notched at the base. **Flowers:** Long peduncled, white with yellow center.

Habitat: Aquatic systems, full to partial sun. **Spread:** Dispersed by seed, but mainly vegetatively by boats, and water movement. **Comments:** Invades lakes, ponds and streams, choking out native species and destroying fish habitat. **Controls:** Prevention, aquatic herbicide treatments, benthic barriers and hand pulling.



Photos by Amy Smagala

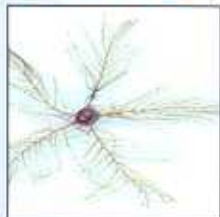
Myriophyllum heterophyllum Variable Milfoil

Family: Haloragaceae
Native to: Eurasia

Description: Submerged aquatic perennial growing 20' tall. **Stems:** Round, thick and reddish. **Leaves:** Feathery leaflets surrounding the stem. **Flowers:** Stalks that emerge above the water with green leaves, June to August.

Habitat: Lakes, ponds, calm streams, and other similar aquatic systems with full to partial sun. **Spread:** It reproduces primarily by vegetative propagules when individual plant segments break off, and dispersed by water movement, humans, and boats.

Comments: Invades water bodies, suppresses native species and destroys fish habitat. **Controls:** Prevention, hand pulling, bottom screening, and aquatic herbicide use.



Flower Stalk

Photos by Amy Smagala

Lythrum salicaria Purple Loosestrife

Family: Lythraceae
Native to: Eurasia

Description: Perennial growing 30-80" tall by $\frac{2}{3}$'s as wide. **Stems:** Squarish with 4-6 sides turning woody in summer. **Leaves:** Opposite to whorled, lanceolate, 2-4" long. **Flowers:** Spiked raceme, purple to magenta, June to October. **Fruit:** Capsule. **Habitat:** Mostly found in wetlands and aquatic systems, full to partial sun. **Spread:** Each plant can produce approximately 2.5 million seeds. Seeds dispersed by water, wildlife and humans. **Comments:** Invades wetlands suppressing native species and destroying wildlife habitat. **Controls:** Hand pull, use a spade to dig larger plants. Apply herbicides or use biological controls (Leaf-feeding Beetles *top left* & Root-feeding Weevils *top right*).

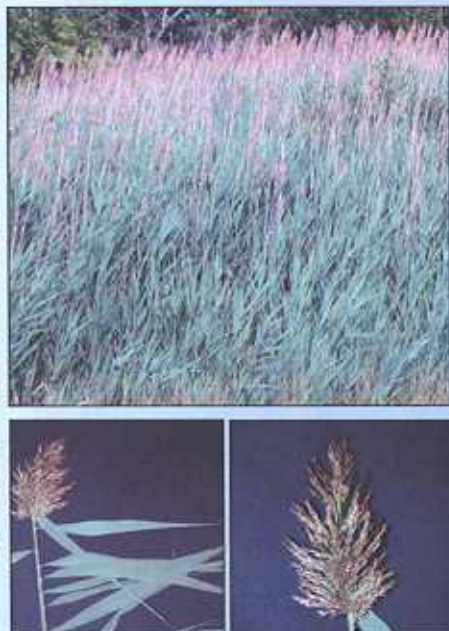


Photos by Douglas Cygan

Phragmites australis Common reed

Family: Poaceae
Native to: Eurasia

Description: Perennial rhizomatous grass growing up to 14' tall. **Stems:** Called 'culms' are large, hollow and grow up to 1" diameter. **Leaves:** Lanceolate, up to 24" long, bluish-green in color. **Flowers:** Panicles with many spikelets. Each spikelet has up to seven small reddish flowers on it. **Habitat:** Mostly found in marshlands, but also grows in freshwater wetlands and aquatic systems, full to partial sun. **Spread:** Spreads primarily by rhizomes. **Comments:** Forms dense colonies that suppress native species and alter wildlife habitat. **Controls:** Hand pull small plants. Use a spade to dig larger plants or apply herbicides.



Photos by Douglas Cygan

GLOSSARY OF TERMS

- Alternate:** Arranged singly at each node, as leaves or buds on different sides of a stem.
- Annual:** Living or growing for only one year or season.
- Aril:** A fleshy, usually brightly colored cover of a seed that develops from the ovule stalk and partially or entirely envelops the seed.
- Berry:** A small, juicy, fleshy fruit.
- Biennial:** Having a life cycle that normally takes two growing seasons to complete.
- Capsule:** A dry dehiscent fruit that develops from two or more united capsules.
- Compound:** Composed of more than one part.
- Deciduous:** Shedding or losing foliage at the end of the growing season.
- Dehiscent:** The spontaneous opening of a fruit at maturity.
- Drupe:** A fleshy fruit usually having a single hard stone enclosing a seed.
- Entire:** Referring to a leaf not having an indented margin.
- Filiform:** Having the form resembling a thread or filament.
- Furrowed:** A rut groove or narrow depression.
- Glabrous:** Having no hairs or projections; smooth.
- Imbricate:** To be arranged with regular overlapping edges.
- Inflorescence:** A cluster of small flowers arranged on a flower stalk.
- Lanceolate:** A leaf tapering from a rounded base toward an apex, lance-shaped
- Axis:** The point at which the leaf is attached to the main stem or branch.
- Lenticels:** The small, corky pores or narrow lines on the surface of the stems of woody plants that allow the interchange of gases between the interior tissue and the surrounding air.
- Lustrous:** Having a sheen or glow.
- Native:** A species that originated in a certain place or region; indigenous.
- Naturalized:** Adapted or acclimated to a new environment without cultivation.
- Opposite:** Growing in pairs on either side of a stem.
- Ovate:** Broad or rounded at the base and tapering toward the end.
- Panicle:** A branched cluster of flowers in which the branches are racemes
- Peduncle:** The stalk of a solitary flower of an inflorescence.
- Peltate:** Leaf being round with the stem attached near its center.
- Perennial:** Living three or more years.
- Perfect:** Having both stamens and pistals in the same flower.
- Pod:** A dry, several-sealed, dehiscent fruit.
- Pubescent:** Covered in fine short hairs.
- Raceme:** Elongated cluster of flowers along the main stem in which the flowers at the base open first.
- Rhizome:** A horizontal, usually underground stem that often sends out roots and shoots from its nodes.
- Samara:** A winged, often one-seed indehiscent fruit as of the ash, elm or maple.
- Simple:** Having no divisions or branches; not compound.
- Umbel:** A flat-topped or rounded inflorescence.

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RESOURCES

Invasive Plant Atlas of New England (IPANE)

<http://invasives.cceb.uconn.edu/ipane>

Natural Resource Conservation Service (NRCS)

<http://plants.usda.gov>

New England Wildflower Society (NEWS)

www.newfs.org

New Hampshire Department of Agriculture, Markets & Food (DAMF)

www.agr.state.nh.us

**New Hampshire Department of Resources & Economic Development,
Natural Heritage Bureau (DRED)**

http://www.nhdf.org/organization/div_nhnhi.htm

**New Hampshire Department of Resources & Economic Development,
Division of Forests and Lands (DRED)**

http://www.nhdf.org/organization/div_nhnhi.htm

New Hampshire Department of Environmental Services (DES)

www.des.state.nh.us/wmb/exoticspecies

New Hampshire Fish & Game Department

www.wildlife.state.nh.us

The Nature Conservancy (TNC)

<http://nature.org>

**U.S. Department of Agriculture's Animal Plant Health Inspection Service
(USDA APHIS)**

www.aphis.usda.gov

University of New Hampshire Cooperative Extension (UNHCE)

www.ceinfo.unh.edu

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